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Contents lists available at ScienceDirect

## The Journal of Arthroplasty

journal homepage: [www.arthroplastyjournal.org](http://www.arthroplastyjournal.org)

# How Has COVID-19 Affected Our Orthopedic Implant Industry Partners? Implications for the Surgeon-Industry Relationship in 2020 and Beyond

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## ARTICLE INFO

### Article history:

Received 16 April 2020

Received in revised form

19 April 2020

Accepted 19 April 2020

Available online xxx

### Keywords:

COVID-19

industry partner

surgeon education

academic practice

private practice

hospital employed

## ABSTRACT

**Background:** The COVID-19 pandemic has had far-reaching societal and financial consequences. The purpose of this study was to evaluate how COVID-19 has affected AAHKS industry partners and the surgeon-industry relationship, emphasizing education, resource allocation, and strategic direction for the 2nd half of 2020.

**Methods:** AAHKS industry partners were contacted to participate in a blinded survey and optional interview with the AAHKS Industry Relations Committee. Based on the results, a group of AAHKS member surgeons with disparate practice types were asked to postulate on how the COVID-19 pandemic has and will affect their practice and relationship with Industry.

**Results:** AAHKS industry partner responses indicated decreased resource allocation for regional, “other national,” and AAHKS annual meetings (67%, 55%, and 30%, respectively). Web-based educational content was expected to increase in 2020 and will likely remain a point of emphasis in 2021 (100% and 70% of responders). For Q3/Q4 2020, a significant emphasis was placed on site of service/outpatient TJA and COVID-19-related safety measures (70% and 90% of responders), as well as increased availability of instrumentation and implants (40% and 60%, respectively).

**Conclusion:** The COVID-19 pandemic has altered the orthopedic landscape for the foreseeable future. Survey responses by AAHKS industry partners demonstrate a continued commitment to surgeon education with and increasing shift to a web-based platform. Increased resource allocation for outpatient TJA and COVID-19-related safety measures were significant. Articulating optimal mechanisms to aid industry in supporting surgeons with different practice models to meet demand during the second half of fiscal year 2020 will be critical.

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One or more of the authors of this paper have disclosed potential or pertinent conflicts of interest, which may include receipt of payment, either direct or indirect, institutional support, or association with an entity in the biomedical field which may be perceived to have potential conflict of interest with this work. For full disclosure statements refer to <https://doi.org/10.1016/j.arth.2020.04.063>.

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<https://doi.org/10.1016/j.arth.2020.04.063>

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The orthopedic practice of AAHKS members, like virtually every other industry in the United States, has been significantly burdened by the negative economic effects of the worldwide COVID-19 pandemic. Elective cases have been essentially eliminated. Fracture cases have slowed, and clinic visits have dropped by as much as 40–90 percent because of social distancing—all of which have contributed to significant strain on orthopedic practices.

The cessation of elective total hip and knee arthroplasty has also had a dramatic effect on AAHKS industry partners. Severe dips in 1st and 2nd quarter implant sales revenue have forced companies

to take proactive steps to conserve capital and maintain liquidity during these uncertain times. The significant financial resources AAHKS industry partners have historically committed to support national and regional orthopedic meetings, surgeon education, clinical research, surgical/vendor operative room (OR) support, and technological innovation have required redistribution to varying degrees to maintain fiscal solvency.

Forecasts for when the US elective procedures may resume suggest that inpatient procedures could potentially restart in some states by mid-May, and most if not all states by the end of June 2020 [1]. Hospitals, orthopedic groups, and Industry must create strategies to address the anticipated increases in demand expected on a return to “normalcy”. In the near term, it will be critical to meet volumetric demands, support the orthopedic workforce, and create more efficient business relationships to maintain continuity in a rapidly changing milieu. Orthopedic practice models of AAHKS members differ significantly and will be affected to varying extents moving forward; the ability to increase production during the 2nd half of the fiscal year for the private practice, academic, and hospital-employed surgeon must be considered both separately and collectively; needs in terms of optimal industry support will be heterogeneous. Owing to the rapidly changing environment and risk of a resurgent COVID-19 virus, long-term strategies must also be articulated to safely prevent another catastrophic full-scale shutdown of elective cases.

## Methods

Executive leadership of AAHKS industry partners with a significant footprint in elective hip and knee arthroplasty were contacted to participate in a brief blinded survey (Table 1) and optional phone or Zoom interview with a member of the AAHKS Industry Relations

Committee. The survey consisted of questions covering 5 topics to gauge changes in industry support resource allocation and workforce including: resources designated for orthopedic meetings, resources designated for surgeon education, resources designated for strategic points of emphasis, effect on industry workforce, and measures taken to meet increased 3rd and 4th quarter demand.

Results were tabulated and distributed a cohort of AAHKS member surgeons with disparate practice models including, private practice, “academic” practice, and hospital-employed practice. Surgeons were asked to consider these results and postulate on how the COVID-19 pandemic has and will affect their specific practice type and relationship with Industry in 2020 and beyond.

## Results

Executive leadership of AAHKS industry partners with a significant footprint in primary elective total hip and total knee arthroplasty were contacted to participate in the survey. Ten responses were received, whereas 2 declined to participate (83%). Full survey results are listed in Figure 1

### Resources Designated for Orthopedic Meeting Participation

Industry partners noted an expected shift in 2020 toward decreased resources designated for orthopedic meeting participation across the board, with responding companies noting decreased support for regional meetings (67%), as well as “other national meetings” (55%), and to a lesser extent the AAHKS Annual Meeting (30%). Uncertainty with respect to orthopedic meeting resource allocation persisted among a small but significant percentage of responders for 2021 (20%-33%), while most responders anticipated a return to standard levels of support (50%-78%). Of responders,

**Table 1**  
Insuistry Survey.

AAHKS Industry Partner Survey: COVID-19 Response		
In response to the COVID-19 pandemic and shutdown of elective hip and knee arthroplasty in the United States, how has your company modified the following?		
Resources Designated for Orthopedic Meetings (Increase, Decrease, No Change, Uncertain)	Q3/Q4 2020	2021
AAHKS Annual Meeting		
AAHKS Spring Meeting		
Other National Meetings		
Regional Meetings		
Resources designated for surgeon education (increase, decrease, no change, uncertain)	Q3/Q4 2020	2021
Resident		
Fellow		
Surgeon		
Hands on Cadaveric		
Web-Based Recorded Video Education/Teaching		
Web-Based Live Video Education/Training		
Resources designated for strategic points of emphasis (increase, decrease, no change, uncertain)	Q3/Q4 2020	2021
Technology (Robotics, Navigation, etc)		
Product R&D		
Marketing		
Outpatient Joint Arthroplasty		
COVID-19-Related Operative Safety Measures		
How has the shutdown of elective arthroplasty cases affected your workforce? (Some have been let go, some have been furloughed, hours have been cut, more than one of the above, no change)		
Implant Production Employees		
Sales Representative Employees		
R&D Employees		
Marketing Employees		
There is an anticipated surge of elective arthroplasty surgical volume in Q3/Q4 2020; What if any measures are being taken to meet the potential increased demand of resources? (increase, decrease, no change, uncertain)		
Instrumentation/Pan Sets		
Implant Production		
Sales Workforce		

30% anticipated increased resource allocation for the AAHKS Annual Meeting in 2021.

#### *Resources Designated for Surgeon Education*

Twenty percent of responding companies anticipated decreased budgeting for resident-, fellow-, and surgeon-specific educational activities in 2020; this was tempered by an across the board increase in web-based recorded and live video educational content (100%). Industry support with educational resources in 2021 can be expected to rebound for resident (40%), fellow (40%) and surgeon (50%) education based on survey responses. Support for web-based live and recorded content was also expected to again increase in 2021 (70%).

#### *Resources Designated for Strategic Points of Emphasis*

The most significant trends identified for resources designated for strategic points of emphasis included a decrease in marketing allocation (60% in 2020), and increased allocation for site of service/outpatient joint arthroplasty and COVID-19-related operative safety measures (70% and 90% of responders in 2020, 70% and 50% in 2021).

#### *Measures Taken to Meet Increased 3rd and 4th Quarter Demand*

In anticipation of a Q3/Q4 2020 surge in elective joint arthroplasty, 90% of responding industry partners anticipated no significant decrease in their sales workforce. Resources designated to increase available instrumentation and support implant production was expected to increase (40% and 50%, respectively) or remain unchanged (60% and 40%, respectively). No industry partner anticipated decreases in instrumentation, implant production, or sales workforce during the fiscal year 2020.

### **Discussion**

Industry support for AAHKS membership has played a critical role driving success of orthopedics in general, and elective hip and knee arthroplasty in specific. Resources directed toward the training of residents, fellows, and surgeons have improved educational offerings. Industry vendor support in the operative room and through implant development have enhanced operative efficiency and improved patient outcomes. The surgeon-industry relationship has become symbiotic to the point where both sides contribute to financial success and viability of a health care system which provides access to quality orthopedic care for the American public. An improved understanding of how the COVID-19 pandemic has affected AAHKS industry partners and enhanced communication will help optimize our combined response as a profession to uncharted waters ahead. The survey and interview responses provided by AAHKS industry partners varied considerably; however, strong common themes of continued commitment to education, as well as the expectation for elevated levels of vendor/surgical support in the 2nd half of 2020 emerged.

#### *Indirect Education Support: National and Regional Meetings*

Industry partners expressed trepidation in their support of regional meetings in 2020 (67% decrease) and a level of uncertainty with regard to the 2020 AAHKS Annual Meeting (30% uncertain, 30% decreased resource allocation). Continued commitment to support for the AAHKS Annual Meeting in 2021, however, was strong (50% no change, 30% increase). This critical continued resource allocation moving forward indirectly supports the

educational mission of our largest arthroplasty society. The extent to which COVID-19 and associated societal scars lingers may very well affect the scope, scale, attendance, and importance of all in person regional and national orthopedic meetings for the foreseeable future.

#### *Direct Education Support*

In terms of direct support to surgeon education, a small downtrend of support at each level of training was identified for 2020; however, a unanimous increase in resources directed toward web-based educational platforms was seen which can potentially benefit all learners. This included 100% of responders directing more resources toward web-based recorded and live video educational content in 2020. As physicians are forced to embrace and become comfortable with telemedicine secondary to COVID-19-induced social distancing, remote engagement and education supported by our industry partners may become a mainstay to reach a large number of individuals without geographic or temporal limitations in a cost- and time-efficient manner.

#### *Surgical Support During 3rd and 4th Quarter 2020*

A common theme across survey responses and phone interviews was a significant commitment to enhanced surgeon support during the anticipated uptick of elective arthroplasty procedure in the second half of the fiscal year. While AAHKS industry partners nearly universally articulated an assurance to partner with surgeons to meet increased need, there is significant uncertainty on how to distribute limited resources and optimally support disparate surgeon practice models. Defining the needs of AAHKS members with different practice models and articulating an appropriate response will allow our industry partners to help smooth the transition back to the OR for all arthroplasty surgeons. Industry partners are working to prepare for the expected surge in demand and appear open to guidance. This is a potential action item for AAHKS and national leadership as we look to the future in 2020 and beyond.

Of industry responders, 70% expected to allocate more resources to “site of service” support such as outpatient joint arthroplasty in both 2020 and 2021. COVID-19-related operative safety measures were also a highly emphasized (90% and 50% in 2020 and 2021, respectively). As this first wave of COVID-19 tamponades, the expected surge of elective cases currently backlogged will likely entail maximally stressing the elective capabilities in certain centers; the needs will be varied and inherently dependent on surgeon practice model. Both sides of the aisle of our profession are currently bracing for the possibility of extended weekday schedules and/or weekend elective schedules where none existed prior. There will be increased emphasis on efficiency of the nonsurgical aspects of cases: pre-op preparation, anesthesia time, turnover times in the OR, etc. Surgical efficiency will also be stressed, yet hopefully maintaining its rightful place behind quality and safety. Our relationship with industry and our implant vendors can play a critical role during this time.

On the vendor side, there could be a significantly greater tug of war for implant reps to be present in multiple hospitals or surgery centers at once, even late into the evenings or on weekends. More instrument sets may be needed to do more of the same case per day, or on consecutive days. As such, central sterilization efforts will heavily be put to the test as well. Refill of implants will be demanded more quickly, and more individual units of the same size will be expected to be available at once, to work through the backlog. We expect that the hip and knee implant manufacturers

will do their best to provide the supply required, as their sales will have been reduced for 3 months or more.

#### *Private Practice Perspective*

Amid the current shutdown of elective arthroplasty, private orthopedic groups, like any independent service provider, have been put at significant risk. That said, with the assistance of industry, private practice groups supporting orthopedic hospitals and physician-owned ambulatory surgery centers may have enhanced logistical mobility to ramp up elective case load at a greater rate than hospital-employed or academic orthopedic surgeons. The ultimate sustainability of private orthopedic practices must come through a resumption of normal business practices. In the meantime, favorable financing structures for capital expenditures and volume-based economic incentives are potential opportunities for industry partners to help “weather the storm”.

There is also risk moving forward that further interruptions in business could be anticipated in the fourth quarter. Some epidemiologists and infectious disease experts have predicted that COVID-19 infections will drop precipitously over the summer, only to come roaring back in the late fall and winter [2]. Hospitals will inevitably shoulder the burden of treating infected patients, as they have currently. Site of care including outpatient surgery centers and physician-owned hospitals will likely be the “clean” hospitals moving forward. These sites which will see less viral burden can serve a public role without placing additional stress on hospital systems. In anticipation, industry could play a large role in helping orthopedic surgeons maintain care pathways that ultimately reduce patient exposure to the COVID-19 virus.

#### *Academic Practice Perspective*

The academic arthroplasty surgeon faces a different set of potential pitfalls. The “red tape” commonly associated with large tertiary referral centers may obviate the ability to increase weekday efforts or add weekend shifts. A push for efficiency may also have an extended impact on teaching at academic institutions, wanting to catch up on wait-lists and make up for lost revenue, as a priority over technical instruction.

Vendor support may be limited because of more stringent access restrictions in tertiary hospitals where COVID-19 patients are still popping up even after the initial surge has abated. Furthermore, at many institutions, there is no contract with one or two manufacturers, but rather a capitation model with a multitude of vendors used for primary and revision joint surgery. It is possible that owing to the financial blow of COVID-19, the model currently in place is urged to change to produce more savings on implant costs. Finally, the confidence that there is no risk of coronavirus transmission will need to be instilled in the patients proceeding to elective surgery, which may be more difficult at a tertiary care center. Whether this involves increased testing, antibody testing, or advanced PPE usage is uncertain.

#### *Hospital-Employed Practice Perspective*

Much like the position of an academic surgeon, the hospital-employed orthopedic surgeon may have to a degree had a buffer

against the immediate economic ramifications of COVID-19 fallout. This group, however, will have highly variable hospital/administrative response in the coming months. The industry may be able to play a role in partnering with hospitals to strengthen a previously existing relationship or forge a new partnership. While the hospital-employed practice is unlikely to be inundated with a surge of semi-urgent revision or infection cases compared with a tertiary referral center, control over when and how to increase production is variable and administration dependent.

As surgical moratoriums are lifted, it is likely that hospital systems will place an emphasis on the rapid resumption of highly profitable elective cases such as total joint arthroplasty to offset fiscal losses imposed by the COVID-19 shutdown [3]. Favorable financing structures for capital expenditures and volume based economic incentives are potential opportunities for industry partners to work with hospital systems to support the hospital-employed orthopedic surgeon.

### **Conclusions**

In summary, most AAHKS industry partner responses indicated a forward-thinking mindset in the face of COVID-19-induced uncertainty. In the short term, emphasis on educational offerings has not been lost, but has been transitioned to a less hands on and more technologically driven “social-distancing” friendly medium. This may very well become a significant aspect of our profession’s “new normal”. Support for “hands on” training that is a stalwart of total joint arthroplasty education will likely rebound but may take time and patience.

It is apparent that arthroplasty surgeons and industry will have to maximize their efforts to work together safely, cohesively, respectfully, and efficiently more than ever before, to weather the tidal wave of surgeries that is sure to come and forge a stronger working relationship and fortify our profession. Early and open communication will be paramount to smoothly adapt to changes in volume and disparate needs of surgeons and practices moving forward.

Orthopedic surgeons, hospitals, and most importantly patients across the United States have benefited greatly from symbiotic partnerships with manufacturers of orthopedic products and implants. Although the current pandemic threatens massive upheaval across the industry, it also provides an opportunity to strengthen the surgeon-industry partnership in 2020 and beyond, enhancing our ability to achieve our ultimate goal—the assurance of access to quality orthopedic care for the American public.

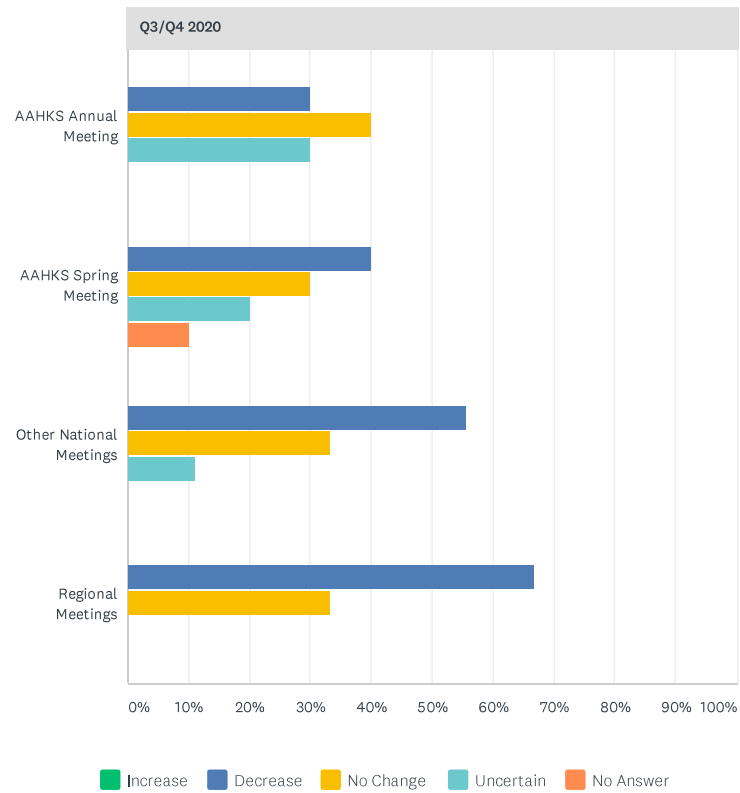
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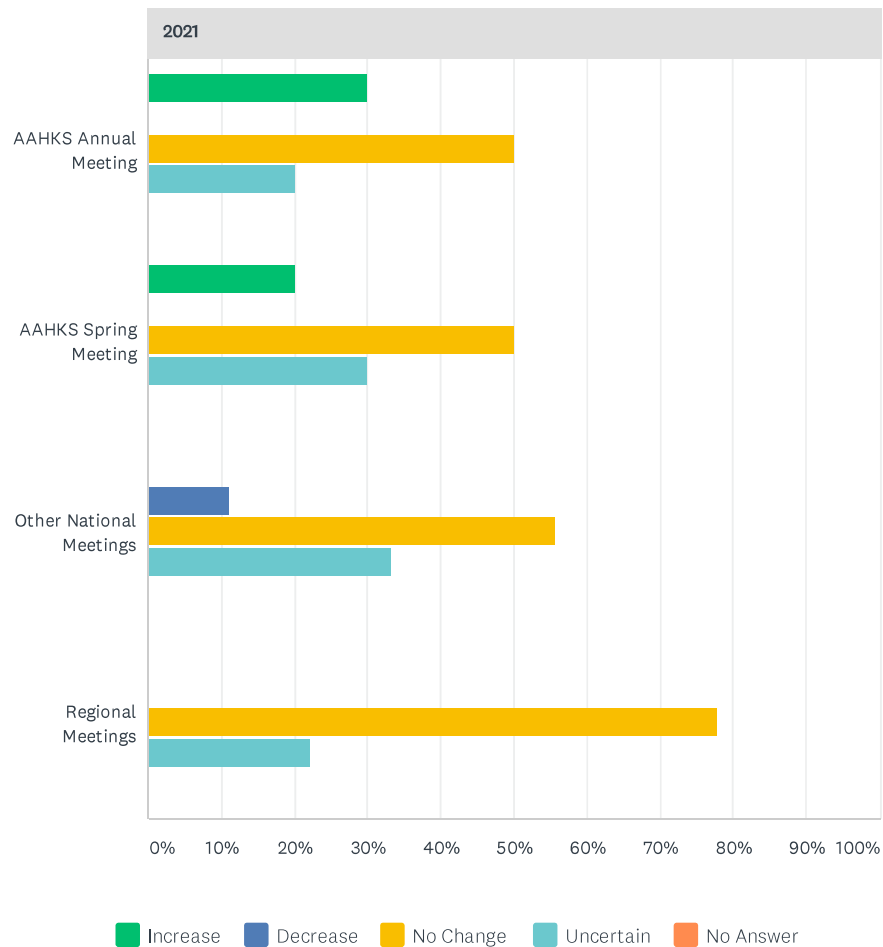
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- [2] <https://finance.yahoo.com/news/covid-19-could-make-a-us-resurgence-this-fall-depending-on-national-response-122231894.html> [accessed 16.04.20].
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## Appendix

## Q1 How will your resources designated for Meeting Participation change?

Answered: 10 Skipped: 0

**Fig. 1.** Final survey results.



Q3/Q4 2020						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
AAHKS Annual Meeting	0.00% 0	30.00% 3	40.00% 4	30.00% 3	0.00% 0	10
AAHKS Spring Meeting	0.00% 0	40.00% 4	30.00% 3	20.00% 2	10.00% 1	10
Other National Meetings	0.00% 0	55.56% 5	33.33% 3	11.11% 1	0.00% 0	9
Regional Meetings	0.00% 0	66.67% 6	33.33% 3	0.00% 0	0.00% 0	9

Fig. 1. (continued).

2021						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
AAHKS Annual Meeting	30.00% 3	0.00% 0	50.00% 5	20.00% 2	0.00% 0	10
AAHKS Spring Meeting	20.00% 2	0.00% 0	50.00% 5	30.00% 3	0.00% 0	10
Other National Meetings	0.00% 0	11.11% 1	55.56% 5	33.33% 3	0.00% 0	9
Regional Meetings	0.00% 0	0.00% 0	77.78% 7	22.22% 2	0.00% 0	9

Fig. 1. (continued).

## Q2 How will your resources designated for Surgeon Education change?

Answered: 10 Skipped: 0

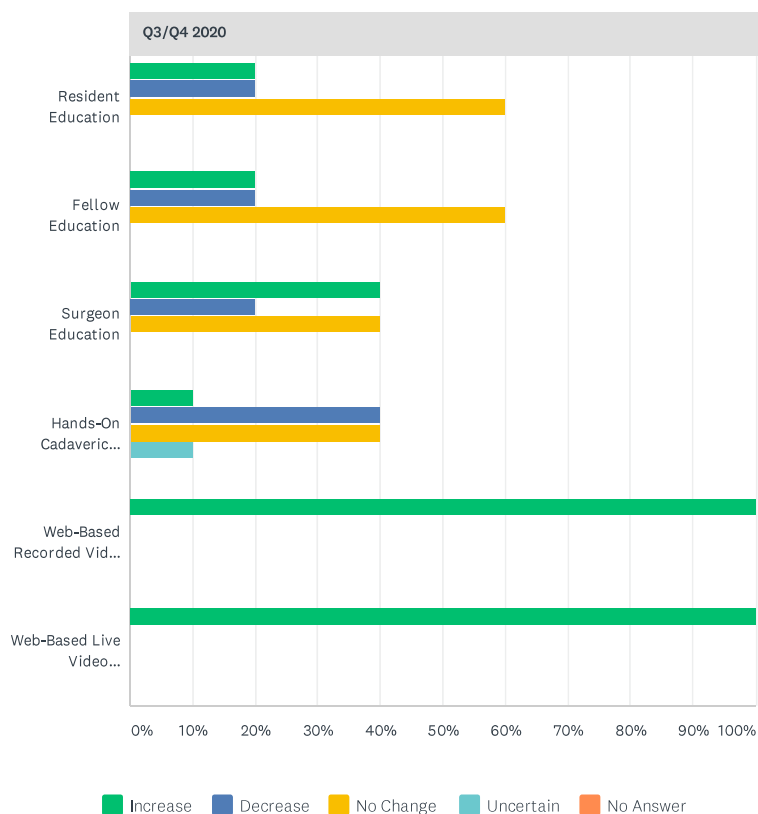
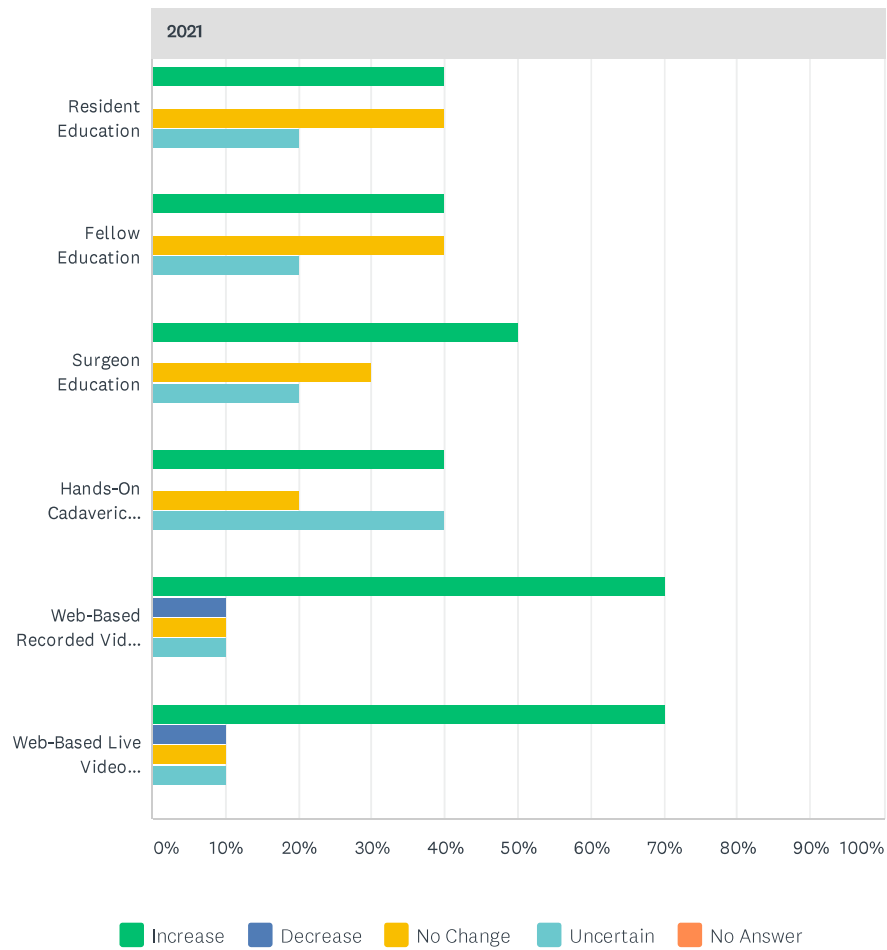


Fig. 1. (continued).





Q3/Q4 2020						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
Resident Education	20.00% 2	20.00% 2	60.00% 6	0.00% 0	0.00% 0	10
Fellow Education	20.00% 2	20.00% 2	60.00% 6	0.00% 0	0.00% 0	10
Surgeon Education	40.00% 4	20.00% 2	40.00% 4	0.00% 0	0.00% 0	10
Hands-On Cadaveric Training	10.00% 1	40.00% 4	40.00% 4	10.00% 1	0.00% 0	10
Web-Based Recorded Video Education/Training	100.00% 10	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10
Web-Based Live Video Education/Training	100.00% 10	0.00% 0	0.00% 0	0.00% 0	0.00% 0	10

Fig. 1. (continued).

2021						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
Resident Education	40.00% 4	0.00% 0	40.00% 4	20.00% 2	0.00% 0	10
Fellow Education	40.00% 4	0.00% 0	40.00% 4	20.00% 2	0.00% 0	10
Surgeon Education	50.00% 5	0.00% 0	30.00% 3	20.00% 2	0.00% 0	10
Hands-On Cadaveric Training	40.00% 4	0.00% 0	20.00% 2	40.00% 4	0.00% 0	10
Web-Based Recorded Video Education/Training	70.00% 7	10.00% 1	10.00% 1	10.00% 1	0.00% 0	10
Web-Based Live Video Education/Training	70.00% 7	10.00% 1	10.00% 1	10.00% 1	0.00% 0	10

Fig. 1. (continued).

### Q3 How will your resources designated for Strategic Points of Emphasis change?

Answered: 10 Skipped: 0

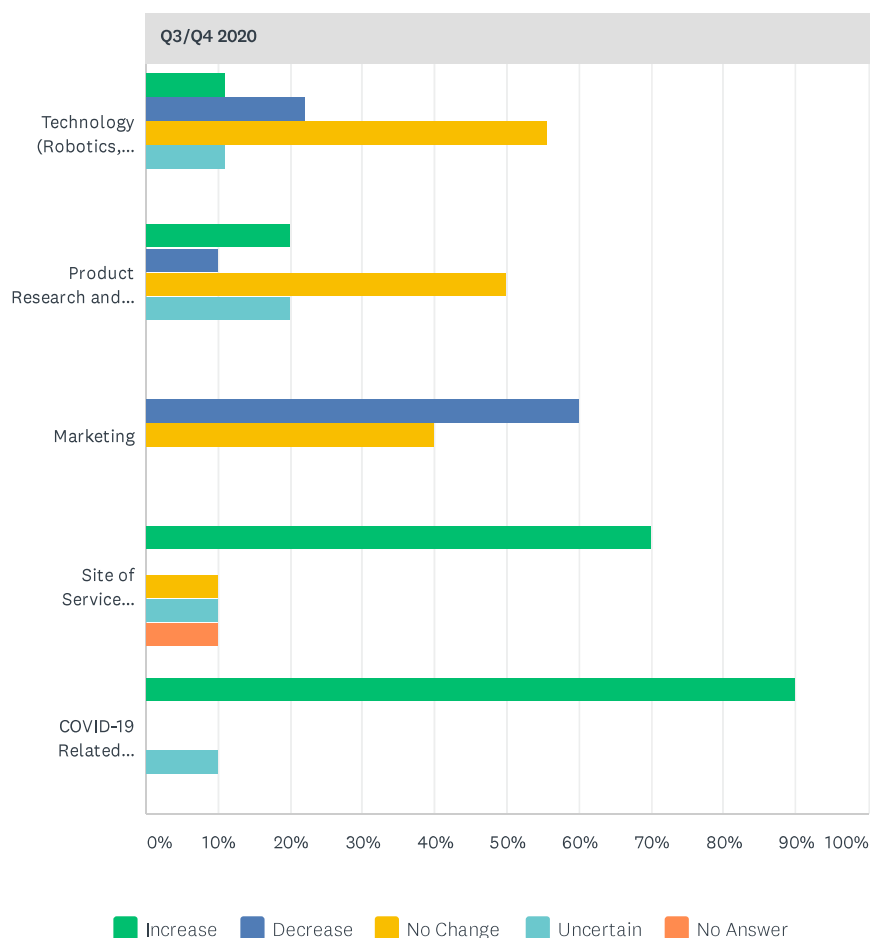


Fig. 1. (continued).

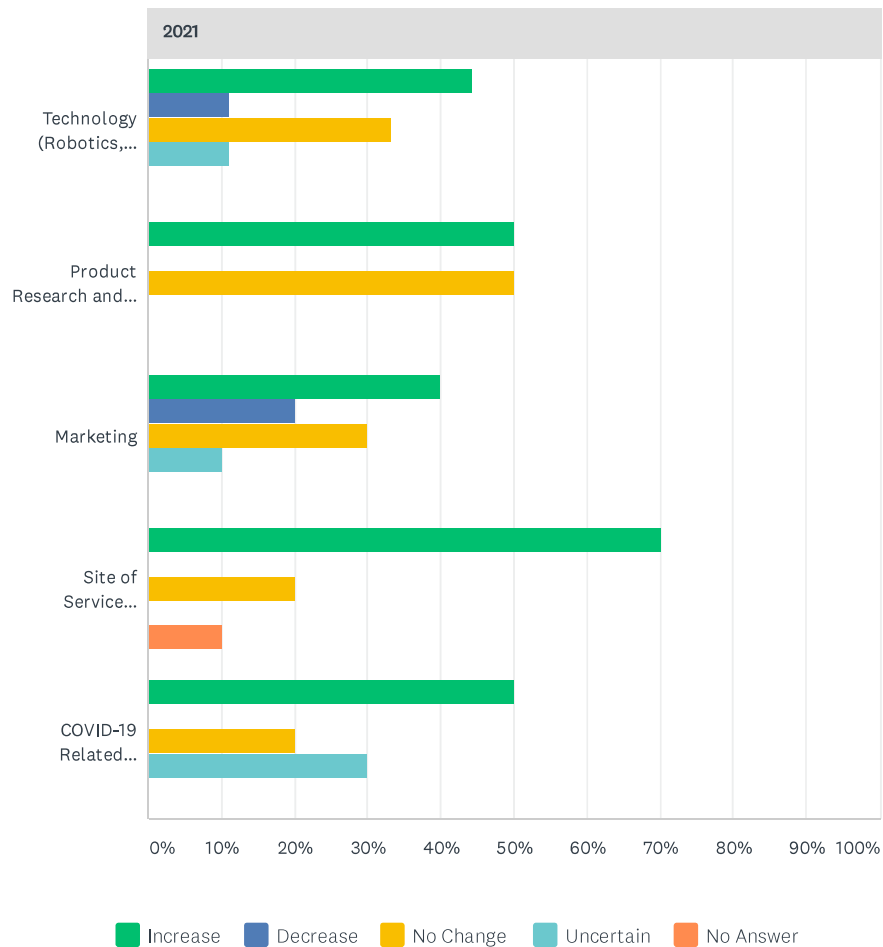
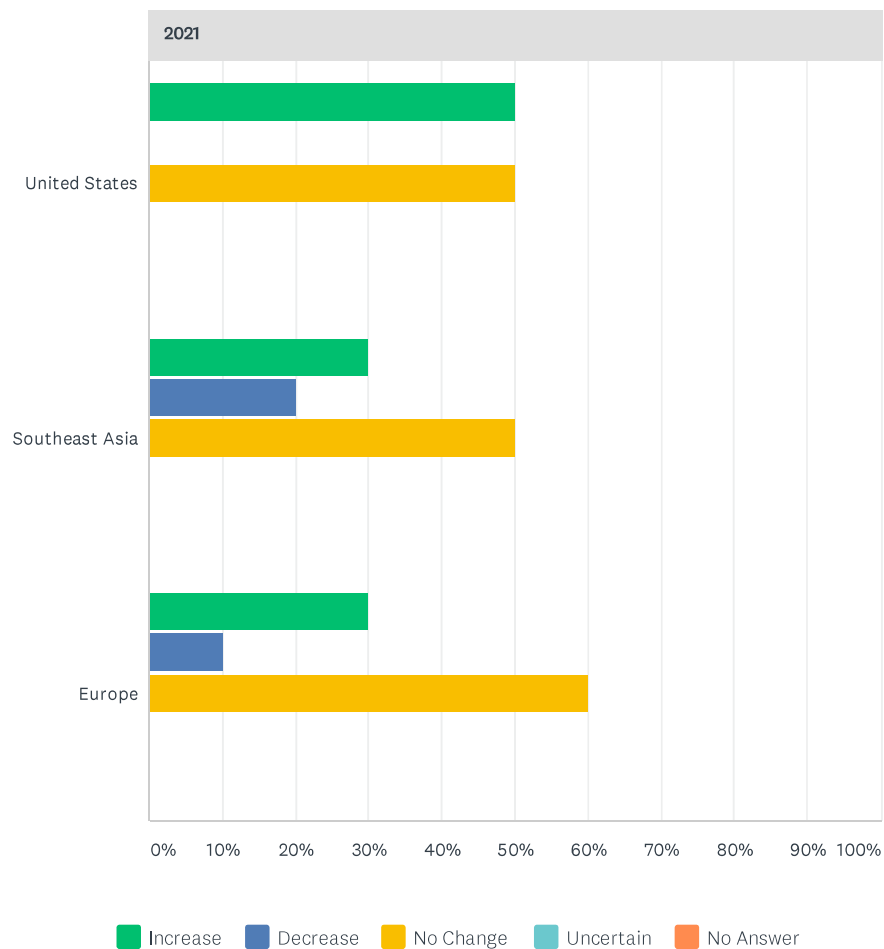


Fig. 1. (continued).

2021						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
Technology (Robotics, Computer-Assisted Navigation etc.)	44.44% 4	11.11% 1	33.33% 3	11.11% 1	0.00% 0	9
Product Research and Development	50.00% 5	0.00% 0	50.00% 5	0.00% 0	0.00% 0	10
Marketing	40.00% 4	20.00% 2	30.00% 3	10.00% 1	0.00% 0	10
Site of Service (Outpatient Joint Replacement)	70.00% 7	0.00% 0	20.00% 2	0.00% 0	10.00% 1	10
COVID-19 Related Operative Safety Measures	50.00% 5	0.00% 0	20.00% 2	30.00% 3	0.00% 0	10

Fig. 1. (continued).

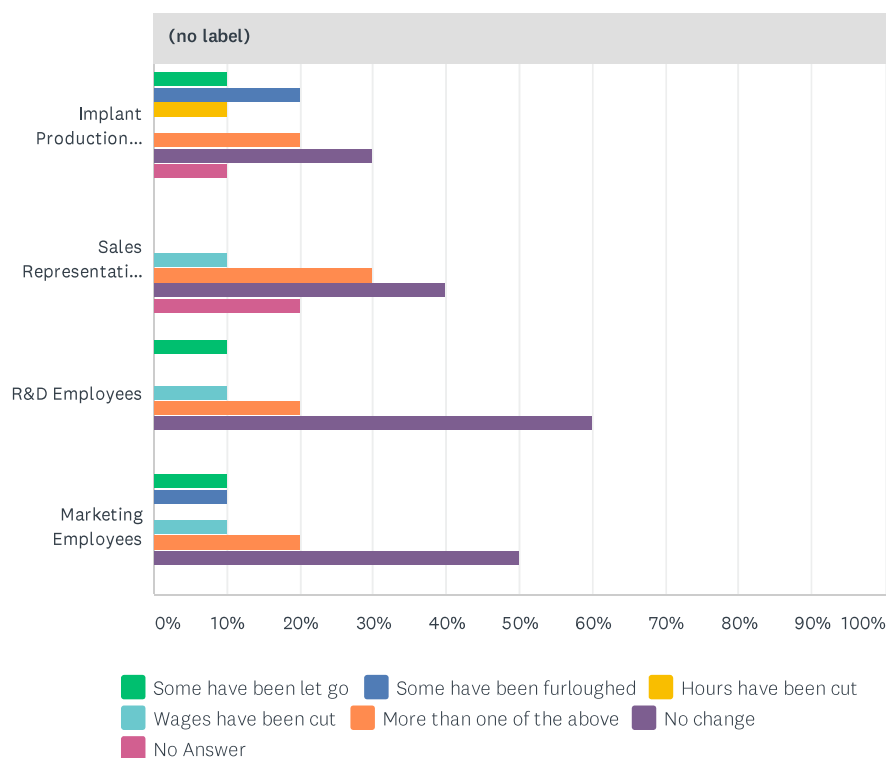


Q3/Q4 2020						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
United States	20.00% 2	10.00% 1	70.00% 7	0.00% 0	0.00% 0	10
Southeast Asia	11.11% 1	33.33% 3	55.56% 5	0.00% 0	0.00% 0	9
Europe	22.22% 2	22.22% 2	55.56% 5	0.00% 0	0.00% 0	9
2021						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
United States	50.00% 5	0.00% 0	50.00% 5	0.00% 0	0.00% 0	10
Southeast Asia	30.00% 3	20.00% 2	50.00% 5	0.00% 0	0.00% 0	10
Europe	30.00% 3	10.00% 1	60.00% 6	0.00% 0	0.00% 0	10

Fig. 1. (continued).

## Q5 How has the shutdown of elective arthroplasty cases affected your workforce?

Answered: 10 Skipped: 0

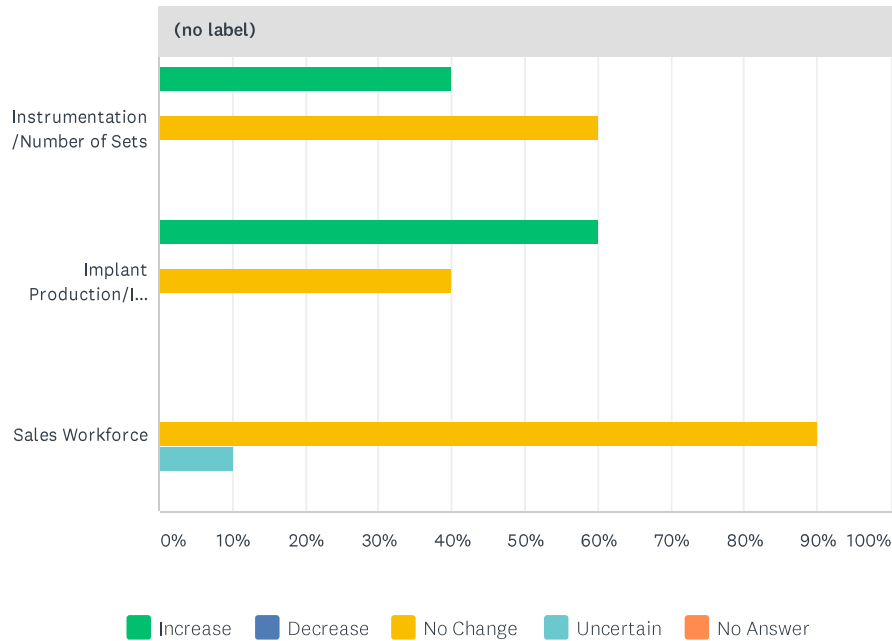


(no label)								
	SOME HAVE BEEN LET GO	SOME HAVE BEEN FURLOUGHED	HOURS HAVE BEEN CUT	WAGES HAVE BEEN CUT	MORE THAN ONE OF THE ABOVE	NO CHANGE	NO ANSWER	TOTAL
Implant Production Employees	10.00% 1	20.00% 2	10.00% 1	0.00% 0	20.00% 2	30.00% 3	10.00% 1	10
Sales Representative Employees	0.00% 0	0.00% 0	0.00% 0	10.00% 1	30.00% 3	40.00% 4	20.00% 2	10
R&D Employees	10.00% 1	0.00% 0	0.00% 0	10.00% 1	20.00% 2	60.00% 6	0.00% 0	10
Marketing Employees	10.00% 1	10.00% 1	0.00% 0	10.00% 1	20.00% 2	50.00% 5	0.00% 0	10

Fig. 1. (continued).

## Q6 There is potential for a surge of the elective arthroplasty surgical volume in Q3/Q4 2020. What measures, if any, are being taken to meet the potential increased demand of resources?

Answered: 10 Skipped: 0



(no label)						
	INCREASE	DECREASE	NO CHANGE	UNCERTAIN	NO ANSWER	TOTAL
Instrumentation/Number of Sets	40.00%	0.00%	60.00%	0.00%	0.00%	10
	4	0	6	0	0	
Implant Production/Inventory	60.00%	0.00%	40.00%	0.00%	0.00%	10
	6	0	4	0	0	
Sales Workforce	0.00%	0.00%	90.00%	10.00%	0.00%	10
	0	0	9	1	0	

Fig. 1. (continued).